

QV  
S796s  
1888

PHYSIOLOGICAL ACTION  
OF MEDICINES.

---

STARR, WALKER AND POWELL.



QV S796s 1888

61820610R



NLM 05063103 9

NATIONAL LIBRARY OF MEDICINE

SURGEON GENERAL'S OFFICE

**LIBRARY.**

5  
**ANNEX**

Section, *Pharmacology*

No. **120712**





# A SYNOPSIS

OF THE

# PHYSIOLOGICAL ACTION

OF

# MEDICINES,

PREPARED FOR THE USE OF THE

STUDENTS OF THE MEDICAL DEPARTMENT OF  
THE UNIVERSITY OF PENNSYLVANIA.

WITH THE APPROVAL OF THE

PROFESSOR OF MATERIA MEDICA.

BY

LOUIS STARR, M.D.,

CLINICAL PROFESSOR OF DISEASES OF CHILDREN IN THE HOSPITAL OF THE  
UNIVERSITY OF PENNSYLVANIA,

AND

JAMES B. WALKER, M.D.,

PROFESSOR OF PRACTICE OF MEDICINE IN THE WOMAN'S MEDICAL COLLEGE,  
PHILADELPHIA.

ASSISTED BY

W. M. POWELL, M.D.,

PHYSICIAN TO THE CLINIC FOR DISEASES OF CHILDREN IN THE HOSPITAL  
OF THE UNIVERSITY OF PENNSYLVANIA.

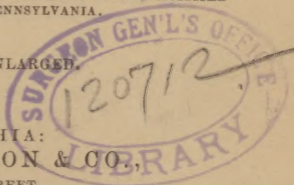
THIRD EDITION; ENLARGED.

PHILADELPHIA:

P. BLAKISTON, SON & CO.,

1012 WALNUT STREET.

1888.



QV

S796s

1888

---

COPYRIGHT, 1887, P. BLAKISTON, SON & CO.

---

## PREFACE TO THIRD EDITION.

---

IN preparing the present edition of this little book, the compilers have endeavored, by certain changes in size and arrangement and by the addition of an index, to better adapt it to the student's use. The original matter has been carefully revised, and a number of new drugs inserted, viz.: Convallaria Majalis, Conium, Gelsemium, Hydrochlorate of Apomorphine, Arsenious Acid, Eucalyptus Globulus, Turpentine and Cocaine. Attention is particularly called to the object of the guide as set forth in the Preface of the Second Edition.

PHILADELPHIA, December, 1887.



## PREFACE TO SECOND EDITION.

---

THE first edition of this little guide having been exhausted, we have been led to its reissue; first, because we have found it of great aid in teaching, and secondly, because so many of our students have expressed their appreciation of its value in directing their labors in the somewhat difficult field of the physiological action of drugs. The present mode of arrangement was determined upon as being more convenient for reference than the chart form.

Our intention is merely to give an outline of the subject, to aid the student in the use of his text-books, not to furnish a substitute for them.

PHILADELPHIA, January, 1880.



# CONTENTS.

	PAGE
Acidum Arseniosum.....	62
“ Carbolicum.....	68
“ Hydrocyanicum.....	30
“ Salicylicum.....	70
Aconiti Folia.....	28
Æther.....	42
Alcohol.....	14
Ammonia.....	12
Amyl Nitritum.....	56
Antimonii et Potassii Tartras.....	20
Apomorphiæ Hydrochloras.....	64
Belladonna.....	40
Caffæa.....	32
Chloral.....	54
Chloroformum.....	44
Cinchona.....	9
Cocaine.....	34
Conium.....	60
Convallaria Majalis.....	20
Digitalis.....	16
Ergota.....	66
Eucalyptus Globulus.....	10
Gelsemium.....	58
Jaborandi.....	66

	PAGE
Jervia.....	22
Nux Vomica.....	46
Opium.....	36
Potassii Bromidum.....	52
Physostigma.....	50
Sabadilla.....	26
Tabacum.....	58
Turpentine.....	16
Veratroidia.. ..	24
Veratrum Viride.....	22

# THE PHYSIOLOGICAL ACTION OF MEDICINES.

## Class I.—PECULIAR BITTERS.

### CINCHONA.

ACTIVE PRINCIPLE—QUINIA.

#### Local Action.

Irritant to mucous membrane, or skin denuded of epidermis.

#### Brain.

*Cerebrum*—

Small doses stimulate.

Large doses paralyze.

#### Spinal Cord.

Reflex action diminished by large doses; probably by stimulation of Setschenow's centres.

#### Circulation.

*Heart*—

Small doses (gr. iij- $\nu$ ) produce no effect.

Large doses (gr. xxx-xc) diminish force and frequency by direct action on heart.

*Arterial pressure*—

Decided lowering, from large doses, due to action on heart.

*Blood*—

Diminishes ozonizing power of red corpuscles.

Perhaps checks amœboid movement of white corpuscles.

#### Digestive Apparatus.

*Stomach*—

Small doses increase appetite and digestion.

Large doses irritate, and cause nausea and vomiting.

#### Temperature.

Lowered by large doses (gr. xx-xlv), by effect on red blood corpuscles, q. v.

## **Peculiar Bitters—*Continued.***

### **Genito-Urinary Apparatus.**

#### *Uterus—*

Does not originate, but increases contractions when present.

### **Mode of Producing Death.**

Cerebral congestion and paralysis.

### **Remarks.**

Antiseptic. Eliminated by kidneys in form of dihydroxyle quinia. Decreases the elimination of urea.

## **EUCALYPTUS GLOBULUS.**

### **Local Action.**

Decided irritant to mucous membrane.

### **Brain.**

Small doses stimulate.

### **Spinal Cord.**

In toxic doses a paralyzant to the spinal cord and medulla.

### **Circulation.**

Arterial pressure lessened.

### **Digestive Apparatus.**

Large doses produce disturbances of the digestive organs ending in diarrhoea.

### **Temperature.**

Increased by small doses; reduced by toxic doses. (Schläger.)

### **Mode of Producing Death.**

Respiratory failure.

### **Remarks.**

Eliminated by the lungs, kidneys and skin. Imparts the odor of violets to the urine. Antiseptic. Excretion of urea is increased.



## Class II.—CARDIAC STIMULANTS.

### AMMONIA.

#### Local Action.

Actively irritant.

#### Spinal Cord.

Reflex action increased by stimulation of motor centres.  
Toxic doses thus cause convulsions.

#### Circulation.

##### *Heart—*

Increases force by direct action on cardiac muscle ; and frequency by stimulating accelerator nerves. Very large doses paralyze cardiac muscle.

##### *Arterial pressure—*

Increased by action on heart.

#### Respiration.

In large doses stimulates respiratory centres.  
(Inhalation of concentrated fumes produces bronchial irritation and œdema of the glottis.)

#### Digestive Apparatus.

##### *Stomach and intestines—*

Toxic doses cause gastro-enteritis.

#### Temperature.

Lowered by toxic doses.

#### Mode of Producing Death.

When swallowed, acts as a violent corrosive poison, producing gastro-enteritis, convulsions and collapse.

When drawn into air passages, œdema of the glottis is produced.

When injected into veins in large quantities, paralyzes cardiac muscle; heart arrested in diastole.

#### Remarks.

Eliminated by kidneys, not as ammonia, but as nitric acid; applies also to the carbonate and chloride of ammonium.

Antidotes—vinegar or dilute vegetable acids, to neutralize.



## Cardiac Stimulants—*Continued.*

### ALCOHOL.

#### Local Action.

Stimulant.

#### Brain.

##### *Cerebrum—*

Small doses stimulate.

Large doses paralyze.

##### *Medulla—*

Affected after, but in same manner as spinal cord, by large doses, q. v.

#### Spinal Cord.

Reflex action abolished by large doses; primarily, by paralysis of sensory centres; secondarily, by paralysis of motor centres.

Affected after brain.

#### Efferent and Afferent Nerves.

Functional activity increased by small doses.

Paralyzed by large doses.

#### Circulation.

##### *Heart—*

Small doses increase force and frequency by stimulating cardiac muscle and accelerator nerves. Large doses, first, diminish force by direct action on cardiac muscle, and frequency by stimulating the inhibitory nerves; secondly, increase frequency by paralyzing the inhibitory nerves.

##### *Arterial pressure—*

First, increased; secondly, diminished, by paralysis of vaso-motor centres.

#### Respiration.

Exhalation of carbonic acid diminished.

#### Digestive Apparatus.

##### *Stomach—*

Small doses increase appetite and digestion.

Large doses diminish both.



## Cardiac Stimulants—*Continued.*

### Temperature.

Exceptionally slightly elevated, by increased activity of circulation.

Usually lowered, proportionately to dose, due to checking of tissue metamorphosis.

In drunkards, effect is less marked.

### Mode of Producing Death.

Nervous system paralyzed.

### Remarks.

Antiseptic. Food. Eliminated by kidneys and lungs, larger proportion consumed in body. Reduces the elimination of urea. In sufficient doses, it produces vaso-motor palsy.

## TURPENTINE.

### Local Action.

Powerful irritant.

### Brain.

Stimulates.

### Spinal Cord.

Moderate doses stimulate the inhibitory reflex centre.

Large doses paralyze it.

### Circulation.

In moderate doses blood pressure elevated by stimulation of vaso-motor centres.

Large doses diminish arterial pressure by paralyzing the vaso-motor centres.

### Respiration.

First increased, then diminished.

### Remarks.

Eliminated by the lungs and kidneys. Gives odor of violets to the urine.

## DIGITALIS.

### Spinal Cord.

Reflex action lessened by toxic doses; primarily, by stimulation of Setschenow's centres; secondarily, by paralysis of cord.



## Cardiac Stimulants—*Continued.*

### Muscular System.

Paralyzed by toxic doses.

### Circulation.

#### *Heart—*

Moderate doses increase force by stimulating intra-cardiac ganglia; and diminish frequency by stimulating inhibitory apparatus and increasing arterial pressure.

Toxic doses diminish force and increase frequency by causing frequent, imperfect systoles, probably by producing over-irritability of the cardiac ganglia.

#### *Arterial pressure—*

Moderate doses increase by stimulating heart and vaso-motor centres.

Toxic doses diminish by reducing heart force.

### Digestive Apparatus.

#### *Stomach—*

Toxic doses cause vomiting.

### Temperature.

Moderate doses elevate in health, lower in fever.

Toxic doses lower.

### Genito-Urinary Apparatus.

#### *Kidneys—*

Action in health varies.

In disease (*e.g.*, cardiac dropsy), elimination of water increased by action on circulation.

### Mode of Producing Death.

Usually arrests cardiac action in systole, by super-excitation or intra-cardiac ganglia.

Rarely, arrests cardiac action in diastole, by super-excitation of inhibitory cardiac nerves.

The symptoms of poisoning are violent vomiting, cephalalgia, rachialgia, feeble, small, intermittent pulse, profound collapse, delirium followed by stupor or convulsions. Pupils dilated.

### Remarks.

Symptoms of poisoning treated by evacuants, tannic acid, opium, alcoholic stimulants.

Digitalis is eliminated by the kidneys.



## Cardiac Stimulants—*Continued.*

### CONVALLARIA MAJALIS.

#### Circulation.

##### *Heart—*

Slows cardiac action.

Toxic doses increase rapidity of cardiac action.

##### *Arterial pressure—*

Increased by medicinal doses; primarily increased and secondarily diminished by toxic doses.

#### Respiration.

Increased in force and diminished in frequency by toxic doses.

#### Remarks.

Heart probably arrested in systole.

## Class III.—CARDIAC SEDATIVES.

### ANTIMONII ET POTASSII TARTRAS.

#### Local Action.

Irritant, producing pustulation.

#### Spinal Cord.

Reflex action abolished by paralysis of cord, especially of sensory centres.

#### Circulation.

##### *Heart—*

Diminishes force by depressing cardiac muscle; frequency, at first, greatly lessened, toward death much increased, why uncertain; inhibitory nerves early paralyzed.

##### *Arterial pressure—*

Reduced. By a direct action on the heart and vasomotor system.

#### Respiration.

Rhythm disturbed by direct action on respiratory centres, and congestion of lungs.



**Cardiac Sedatives—Continued.****Digestive Apparatus.***Stomach and intestines—*

Irritant in ingestion and elimination.

**Temperature.**

Lowers. Only in toxic doses, in small doses not marked.

**Mode of Producing Death.**

Cardiac paralysis, arrest occurring in diastole.

Symptoms of poisoning those of gastro-enteritis, death usually preceded by stupor or convulsions.

**Remarks.**

Chemical antidote—tannic acid. Opium internally, and externally stimulation.

Elimination takes place from mucous membrane of the alimentary canal. Urine increased in mild cases, but before death bloody and scanty.

**VERATRUM VIRIDE.**

ACTIVE PRINCIPLES—JERVIA, VERATROIDIA.

**JERVIA.****Local Action.***Very feebly* irritant.**Brain.**

Clonic convulsions, due to lessening circulation at the base of brain.

**Spinal Cord.**

Reflex action abolished by direct action on motor centres.

**Circulation.***Heart—*

Diminishes force and frequency by paralyzing cardiac muscle.

*Arterial pressure—*

Lowers, by depressing vaso-motor centres.

**Respiration.**

Arrested before cardiac action.



## Cardiac Sedatives—*Continued.*

### Digestive Apparatus.

*Salivary glands—*

Secretion greatly increased.

### Temperature.

Lowers.

### Mode of Producing Death.

Asphyxia.

## VERATROIDIA.

### Local Action.

Irritant.

### Brain.

Clonic convulsions, due to lessening of circulation at the base of brain; less severe and frequent than those caused by jervia.

### Spinal Cord.

Reflex action abolished by direct action on motor centres.

### Circulation.

*Heart—*

Small doses reduce frequency by stimulating inhibitory nerves.

Large doses increase frequency by paralyzing peripheral ends of inhibitory nerves.

*Arterial pressure—*

Increased by asphyxia and secondary vaso-motor spasm. No direct action on vaso-motor nerves.

### Respiration.

Arrested by paralysis of centres.

### Digestive Apparatus.

*Stomach and intestines—*

Causes vomiting and purging.

### Temperature.

Lowers.

### Mode of Producing Death.

Asphyxia. Due to paralysis of respiratory muscles.



## Cardiac Sedatives—*Continued.*

### Action as *Veratrum Viride*.

Lowers pulse rate by a direct action on heart muscle (*jervia*), and by stimulating inhibitory nerves (*veratroidia*); diminishes force of heart beat by a direct influence on cardiac muscle (*jervia*); and produces a general vaso-motor paralysis (*jervia*), more or less complete, according to the dose.

Spinal depressant.

Increases functional activity of skin.

### Remarks.

The drug is a sedative to the motor nervous system, and yet produces convulsions.

The vomiting produced by large doses a great safeguard against poisoning.

The increase of arterial pressure noted under *veratroidia* never seen practically.

Antidotes—Laudanum in full doses by the rectum. Brandy and whisky, ammonia, sinapisms.

## SABADILLA.

### ACTIVE PRINCIPLE—*VERATRIA*.

#### Local Action.

Actively irritant.

#### Efferent and Afferent Nerves.

Functional activity primarily increased, secondarily paralyzed.

#### Muscular System.

Primarily, hyper-excitability; secondarily, paralysis.

#### Circulation.

##### *Heart—*

Large doses, first, diminish frequency by stimulating inhibitory apparatus, and increase force by stimulating cardiac muscle; secondly, increase frequency and diminish force by paralyzing the same.

##### *Arterial pressure—*

First, increased by stimulation of vaso-motor centres; secondly, lowered by paralysis of the same.

#### Respiration.

Arrested by paralysis of centres. (Bezold and Hirt.)



**Cardiac Sedatives—Continued.****Digestive Apparatus.**

*Stomach and intestines—*  
Irritated.

**Temperature.**

First, reduced; secondly, rises to normal; finally, reduced on approach of death.

**Mode of Producing Death.**

Asphyxia. *Sabadilla*, like the other vegetable cardiac sedatives, produces convulsions, with great muscular weakness.

**A muscle poison and nerve poison.**

**Remarks.**

Convulsions, spinal. Three stages in poisoning—1st. Excitation or restlessness; 2d. Convulsions; 3d. Paralysis.

**ACONITI FOLIA; RADIX.**

ACTIVE PRINCIPLE—ACONITIA.

**Local Action.**

Irritant and narcotic.

**Brain.**

*Perceptive centres—*

Paralyzed, producing amesthesia and apparent motor paralysis.

Voluntary motion lost late in poisoning,

**Spinal Cord.**

Reflex action abolished by paralysis of sensory centres late in poisoning, but before loss of voluntary motion.

**Efferent Nerves.**

Paralyzed late, after loss of voluntary motion.

**Afferent Nerves.**

Paralysis, first of peripheral ends, second of trunks. Occurs after paralysis of perceptive centres.

**Circulation.**

*Heart—*

Reduces force and frequency by acting directly on cardiac muscle, possibly at first stimulates inhibitory centres.



## Cardiac Sedatives—*Continued.*

### *Arterial pressure—*

Reduced. Vaso-motor action uncertain, afferent nerves or conducting spinal tract probably paralyzed, so that peripheral impressions do not affect vaso-motor centres.

### **Respiration.**

Arrested by paralysis of centres.

### **Digestive Apparatus.**

#### *Stomach—*

Causes a burning sensation and sometimes vomiting.

### **Temperature.**

Toxic doses lower.

### **Mode of Producing Death.**

The drug kills by causing asphyxia on a sudden arrest of the cardiac action in diastole.

The characteristic symptom of poisoning is *tingling* in the extremities. Like the other vegetable cardiac sedatives it causes convulsions, with great muscular weakness.

### **Remarks.**

Physiological antidotes—digitalis, ammonia and alcohol.

## ACIDUM HYDROCYANICUM.

### **Brain.**

#### *Cerebrum—*

Abolishes functions by direct action on gray matter.

Produces clonic convulsions by disturbing circulation in brain.

### **Spinal Cord.**

Reflex activity lessened by action on afferent nerves, q. v.

### **Efferent and Afferent Nerves.**

Functional activity diminished.

### **Muscular System.**

Functional activity abolished.



**Cardiac Sedatives—Continued.****Circulation.***Heart—*

Diminishes frequency by stimulating the cardiac inhibitory nerves, and force by paralyzing cardiac muscle. In very large doses, suddenly arrests heart in diastole.

*Arterial pressure—*

Primarily stimulates very briefly the vaso-motor system directly or indirectly, and afterward paralyzes it.

**Respiration.**

Slowed, and finally arrested, by paralysis of respiratory centres.

**Eye.**

Pupil dilated by paralysis of oculo-motor nerves.

**Mode of Producing Death.**

Asphyxia usually; sometimes, in *very large* doses, by combined cardiac paralysis and asphyxia.

Symptoms of poisoning have been divided into three stages: 1st, very brief; difficult respiration, with prolonged expiratory movements, slow pulse, disturbed cerebation; 2d, violent convulsions, dilated pupils, unconsciousness; 3d, collapse, paralysis, asphyxia.

**Remarks.**

Antidotes. Atrophia suggested; ammonia by inhalation and injection in veins.

**Class IV.—ANTISPASMODICS.****CAFFEA.****ACTIVE PRINCIPLE—CAFFEIN.****Brain.***Cerebrum—*

Toxic doses stimulate.

Small doses stimulate; increase reasoning faculties and imagination.



## **Antispasmodics—Continued.**

### **Spinal Cord.**

Reflex action primarily increased, secondarily diminished, by toxic doses.

### **Afferent Nerves.**

Paralyzes, when directly applied.

### **Muscular System.**

Causes contraction of voluntary muscles, when directly applied, with loss of response to galvanic current.

### **Circulation.**

#### *Heart—*

Toxic doses first increase; secondly, diminish action, probably by acting directly on muscle.

#### *Arterial pressure—*

Toxic doses first increase, then lower.

### **Respiration.**

Toxic doses disturb rhythm, and finally arrest.

### **Temperature.**

Toxic doses first lower, then elevate.

### **Mode of Producing Death.**

Arrest of respiration.

## **COCAINE.**

### **Local Action.**

Powerfully anæsthetic.

### **Brain.**

Primarily, stimulates. Secondarily, produces narcosis preceded by convulsions and pendulum-like movements of the head.

### **Spinal Cord.**

Probably stimulates.

### **Afferent Nerves.**

Paralyzes.

### **Efferent Nerves.**

Paralyzes later.



### **Antispasmodics—Continued.**

#### **Circulation.**

##### *Heart—*

In medicinal doses cardiac stimulant.

#### **Respiration.**

Toxic doses arrest respiration.

#### **Digestive Apparatus.**

Moderate doses increase peristalsis, large doses diminish.

#### **Temperature.**

Toxic doses first elevate, then lower.

#### **Mode of Producing Death.**

Arrest of respiration.

#### **Remarks.**

Eliminated by the kidneys.

## **Class V.—ANALGESIC.**

### **OPIUM.**

#### **ACTIVE PRINCIPLE—MORPHIA.**

#### **Local Action.**

Sedative.

#### **Brain.**

##### *Cerebrum—*

Small doses stimulate, especially the imagination.

Large doses cause sleep, stupor and coma, by direct action on nerve tissue.

#### **Spinal Cord.**

Reflex action primarily increased, secondarily paralyzed; masked by brain symptoms in man and the higher animals.

#### **Efferent and Afferent Nerves.**

Paralyzed in lower animals.



**Analgesic—Continued.****Circulation.***Heart—*

First, increases force and diminishes frequency by stimulating inhibitory nerves and centres, perhaps, also, by stimulating cardiac muscle; secondly, diminishes force, and increases frequency by paralyzing the peripheral vagi.

*Arterial pressure—*

First, increases by stimulating, and, secondly, lowers by depressing vaso-motor system.

**Respiration.**

Arrested by paralysis of centres.

**Digestive Apparatus.***Gastro-intestinal glands—*

Secretion checked. Small doses diminish peristaltic movement, toxic doses increase it. Constipation.

**Temperature.**

First, elevated; secondly, lowered.

**Genito-Urinary Apparatus.***Kidneys—*

Urine generally diminished in quantity.

**Eye.**

Pupil, first, contracted, due to stimulation of oculo-motor centres; secondly, dilated, late in poisoning, due to paralysis of the same.

**Mode of Producing Death.***Arrest of respiration.*

The symptoms of advanced poisoning are coma; pupils absolutely contracted or, as death approaches, widely dilated; slow, feeble, interrupted respiration; rapid, feeble pulse; face cyanosed; skin pale, cold, covered with clammy sweat.

**Remarks.**

Indications for treating poisoning are to evacuate stomach, to maintain respiration, and to maintain circulation. Chemical antidote—tannic acid. Physiological antidote—atropia.

Opium is eliminated by the kidneys.



## Class VI.—MYDRIATIC.

### BELLADONNA.

#### ACTIVE PRINCIPLE—ATROPIA.

#### Local Action.

Sedative.

#### Brain.

Large doses cause delirium, followed by stupor.

#### Spinal Cord.

Reflex activity increased; masked by action on nerves.

#### Efferent Nerves.

Large doses paralyze.

Paralysis occurs before spine is affected.

#### Afferent Nerves.

Large doses paralyze.

#### Circulation.

##### *Heart—*

Small doses increase frequency by paralyzing inhibitory nerves and by stimulating accelerator centres or nerves. Sometimes the frequency is at first diminished by a primary stimulation of inhibitory centres.

Large doses diminish force by paralyzing heart muscle.

##### *Arterial pressure—*

Small doses elevate by stimulating vaso-motor centres.

Large doses lower by paralyzing muscles in walls of arterioles.

#### Respiration.

First, stimulates respiratory centres; secondly, near death, paralyzes respiratory nerves and checks respiration.

#### Digestive Apparatus.

##### *Salivary glands—*

Saliva decreased.

##### *Gastro-intestinal glands—*

Secretion increased.

Inhibitory and accelerator nerves both paralyzed; but the former first, putting the muscles of the intestines, for a time, in a condition to respond more readily to stimuli.



**Mydriatic—Continued.****Temperature.**

Small doses elevate.

Large doses lower.

**Eye.**

Pupil dilated, due to paralysis of peripheral ends of oculo-motor nerves, and, probably, also to stimulation of peripheral extremities of sympathetics.

**Mode of Producing Death.**

Asphyxia, ordinarily; sometimes cardiac failure.

The chief symptoms of poisoning are dryness of the throat, red efflorescence of the skin, dilated pupils, rapid respiration and pulse, delirium, sometimes convulsions, ending in stupor, cold extremities and paralysis, with arrest of respiration.

**Remarks.**

Chemical antidote—tannic acid.

Physiological antidotes—physostigma and jaborandi appear to be somewhat antagonistic. Value of opium in belladonna poisoning not determined.

Eliminated by kidneys.

NOTE.—Stramonium and hyoscyamus are like atropia in their physiological actions.

**Class VII.—ANÆSTHETICS.****ÆTHER.****Local Action.**

Irritant if prevented from, and refrigerant if permitted to evaporate.

**Brain.**

*Cerebrum*—

Primarily, stimulated; secondarily, paralyzed.

*Medulla*—

Affected after spinal cord. Paralysis, first, of sensory, and second, of motor centres.



**Anæsthetics—Continued.****Spinal Cord.**

Reflex action abolished by paralysis, first, of sensory, and second, of motor centres.

**Circulation.***Heart—*

Increases force and frequency.

*Arterial pressure—*

Increased.

**Respiration.**

Slowed, and finally arrested by paralysis of respiratory centres.

**Digestive Apparatus.***Stomach—*

Produces nausea and vomiting, especially when stomach contains food.

**Mode of Producing Death.**

Slow asphyxia from paralysis of the respiratory centres.

**Remarks.**

Eliminated by kidneys and lungs.

**CHLOROFORMUM.****Local Action.**

Vesicant if prevented from, and refrigerant if permitted to evaporate.

**Brain.***Cerebrum—*

Primarily, stimulated (stage of stimulation shorter than that of ether); secondarily, paralyzed.

*Medulla—*

Affected after spinal cord. Paralysis, first, of sensory, and second, of motor centres.

**Spinal Cord.**

Reflex action abolished by paralysis, first, of sensory, and second, of motor centres.



**Anæsthetics—Continued.****Circulation.***Heart—*

Sometimes, first, diminishes frequency by stimulating inhibitory centres; then increases frequency by paralyzing the same. Force diminished by direct action on cardiac muscle, ending in paralysis.

*Arterial pressure—*

Diminished by paralysis of vaso-motor centres and depression of cardiac action.

**Respiration.**

Primarily, slowed; secondarily, quickened, with disturbed rhythm, and finally arrested.

**Digestive Apparatus.***Stomach—*

Nausea and vomiting very rarely produced.

**Eye.**

Pupil, first, contracted, by stimulation of oculo-motor centres, and secondly, dilated by paralysis of same.

**Mode of Producing Death.**

Usually, in man, by cardiac paralysis, rarely by asphyxia.

**Remarks.**

Eliminated by kidneys and lungs.

**Class VIII.—EXCITO-MOTOR.****NUX VOMICA.**

ACTIVE PRINCIPLE—STRYCHNIA.

**Local Action.**

Slightly irritant.

**Brain.**

Exhilaration.



## **Excito-Motor—Continued.**

### **Spinal Cord.**

Reflex action increased by stimulation of motor centres.

### **Efferent Nerves.**

Large doses paralyze.

### **Circulation.**

#### *Heart—*

Perhaps increases frequency by paralyzing inhibitory nerves.

#### *Arterial pressure—*

Elevated by vaso-motor spasm, due to stimulation of vaso-motor centres.

### **Respiration.**

Arrests, by causing spasm of respiratory muscles.

### **Digestive Apparatus.**

#### *Stomach—*

Small doses stimulate appetite and digestion.

### **Eye.**

Acuteness of vision increased, at first; afterward vision is disordered.

### **Mode of Producing Death.**

Asphyxia, due to spasm of respiratory muscles. Death occurs at times from exhaustion.

After poisonous doses, tonic spasms quickly appear, first in the extremities. Muscles of jaw affected last.

### **Remarks.**

Chemical antidotes—tannic acid, iodine or one of its soluble salts.

Physiological antidotes—bromide of potassium, chloral, nitrite of amyl, ether, chloroform, physostigma.



## Class IX.—DEPRESSO-MOTORS.

### PHYSOSTIGMA.

ACTIVE PRINCIPLE—PHYSOSTIGMIA.

#### Local Action.

Irritant.

#### Spinal Cord.

Reflex action depressed.

#### Circulation.

*Heart—*

Small doses exert a feeble influence compared to that on the nervous system.

Large doses act directly on cardiac muscle, rendering beats slower and more forcible, and finally abolishing them; primary action aided by stimulation of peripheral vagi. Arrested in diastole.

*Arterial pressure—*

First, lowered, due to slowing of heart's action; secondly, elevated by increased strength of action; finally, lowered by loss of cardiac power.

#### Respiration.

Arrested.

#### Digestive Apparatus.

*Intestinal canal—*

Toxic doses, first, increase peristalsis; secondly, produce tetanic contraction of intestinal muscles; finally, paralyze. Acts directly on muscles or contained ganglia.

#### Temperature.

Slightly elevated.

#### Eye.

Pupil contracted, probably by stimulation of peripheral ends of oculo-motor, and paralysis of peripheral ends of sympathetic nerves.

#### Mode of Producing Death.

Syncope, or consentaneous failure of cardiac and respiratory functions.



**Depresso-Motors—Continued.****Remarks.**

Eliminated by kidneys.

Atropia worthy of trial as an antidote.

Twitching of muscles, due to the direct muscular action of the drug.

**POTASSII BROMIDUM.****Local Action.**

When directly applied, destroys function of all higher organic tissues (heart, nerves, etc.).

**Brain.**

Produces sleep and abolition of special senses.

**Spinal Cord.**

Reflex action abolished by paralysis of sensory centres of cord and afferent nerves. (Peripheral ends.)

**Afferent Nerves.**

Paralyzed; loss of function commencing at peripheral ends.

**Circulation.***Heart—*

Small doses diminish frequency by direct action on cardiac muscle.

Toxic doses paralyze cardiac muscle.

*Arterial pressure—*

Action on vaso-motor system uncertain, probably produces vaso-motor spasm.

**Respiration.**

Slowed, and finally arrested, by toxic doses.

**Temperature.**

Lowered. Probably by checking tissue change.

**Genito-Urinary Apparatus.**

Sexual function depressed; impotence produced by persistent use.

**Mode of Producing Death.**

Cardiac paralysis, or asphyxia.

**Remarks.**

Eliminated by skin, kidneys and intestines.



**Depresso-Motors—Continued.****CHLORAL.****Local Action.**

Irritant.

**Brain.**

Produces sleep by direct action on cerebrum.

*Perceptive centres—*

Small doses may cause hyperæsthesia.

Very large doses cause anæsthesia.

**Spinal Cord.**

Reflex action, primarily, increased by stimulation of motor centres.

Secondarily, diminished and finally abolished by paralysis of the same.

**Circulation.***Heart—*

Small doses produce no effect.

Large doses arrest cardiac action in diastole, perhaps by affecting centres in medulla.

*Arterial pressure—*

Small doses increase by stimulating vaso-motor centres.

Large doses lower, probably, by paralyzing the same.

**Respiration.**

Disturbs rhythm, and finally arrests, by paralyzing respiratory centres.

**Temperature.**

Lowered.

**Eye.**

Pupil, first contracted, then dilated.

**Mode of Producing Death.**

The symptoms produced by a toxic dose are coma; intense muscular relaxation; weak, thready pulse; reduced temperature; paralysis; anæsthesia, with final arrest of respiration or of the heart's action.

**Remarks.**

In poisoning, maintain bodily heat; atropia and strychnia suggested as antidotes. Chloral coagulates albumen—20 grains largest safe dose.



**Depresso-Motors—Continued.****AMYLI NITRITUM.****Local Action.**

When directly applied, destroys function of all higher organic tissues.

**Spinal Cord.**

Reflex action abolished by paralysis of motor centres of cord.

**Efferent Nerves.**

Functional activity diminished.

**Muscular System.**

Functional activity diminished.

**Circulation.***Heart—*

First, increases frequency, perhaps, by stimulating the heart; secondly, diminishes force, by paralyzing cardiac muscle.

*Arterial pressure—*

Lowered; first, by paralysis of muscles in arterioles; secondly, by paralysis of cardiac muscle and also of vaso-motor centres.

*Blood—*

Ozonizing power of red corpuscles lessened.

**Respiration.**

Arrested by paralysis of respiratory centres.

**Temperature.**

Reduced by the diminution of oxidation and tissue-change.

**Genito-Urinary Apparatus.***Kidneys—*

Elimination of large quantities of sugar, with a greatly increased quantity of urine.

**Mode of Producing Death.**

Asphyxia.

**Remarks.**

Eliminated by lungs.

Nitrite of amyl and belladonna both act on muscles in arterioles. Arterial blood becomes the same color as venous.

NOTE.—Potash, ipecac and arsenic are like depresso-motors.



**Depresso-Motors—Continued.****GELSEMIUM.****Brain.***Cerebrum—*

Scarcely affected.

**Spinal Cord.**

Paralyzes.

**Circulation.***Heart—*

Large doses diminish pulse rate by direct action on the heart.

*Arterial pressure—*

Lowered by direct action on the heart.

**Respiration.**

Arrested by direct action upon the respiratory centres.

**Eye.**

A small dose causes contraction of the pupil.

Toxic doses cause dilatation of the pupil, due to paralysis of the peripheral ends of the oculo-motor nerves.

**Remarks.**All the motor nerves of the head are paralyzed. Antidote—  
Large doses of morphia.**TABACUM.****ACTIVE PRINCIPLE—NICOTIA.****Local Action.**

Irritant.

**Spinal Cord.**

Reflex action, first excited; secondly depressed; producing convulsions and tetanic rigidity, followed by paralysis.

**Efferent Nerves.**

Functional activity first excited, then paralyzed.

**Circulation.***Heart—*

First, diminishes; secondly, increases pulse rate—uncertain how.

*Arterial pressure—*

First, lowers, then elevates—uncertain how.



**Depresso-Motors—Continued.****Respiration.**

Arrested.

**Digestive Apparatus.**

*Intestinal canal—*

Tetanic contraction of muscles produced; also nausea and vomiting, and diarrhoea.

**Temperature.**

Lowered.

**Genito-Urinary Apparatus.**

*Kidneys—*

Elimination of urine increased.

**Eye.**

Pupil contracted, probably by paralysis of sympathetic nerve endings and stimulation of oculo-motor nerve endings.

**Mode of Producing Death.**

Asphyxia.

**Remarks.**

Probably eliminated by kidneys. Convulsions are spinal.

Antidotes—Wash out stomach, give ammonia and alcohol in large doses, hypodermic of strychnia, artificial respiration, etc.

**CONIUM.****Local Action.**

Irritant.

**Nervous System.**

Efferent nerves paralyzed.

**Spinal Cord.**

Depressant action (probably).

**Circulation.**

*Heart—*

Pulse first accelerated, afterward retarded.

*Arterial pressure—*

Lowered at first, afterward rises above normal.

**Temperature.**

Uncertain. Increases temperature in toxic or therapeutic doses.



**Depresso-Motors—Continued.****Eye.**

Pupil dilated, owing to oculo-motor paralysis.

**Remarks.**

Symptoms of poisoning. Locomotion almost impossible, burning in the mouth, vomiting, frontal headache, finally paralysis of accommodation.

Antidote—No physiological antidote is known; atropia is suggested.

**Class X.—ALTERATIVES.****ACIDUM ARSENIOSUM.****Local Action.**

Irritant.

**Spinal Cord.**

Paralysis by direct action of the drug upon the nerve centres.

**Circulation.***Heart—*

Lessens the rapidity and force of the beat, by direct action on the cardiac muscle.

*Arterial pressure—*

Lowered, due to vaso-motor paralysis.

**Digestive Apparatus.**

Small doses increase appetite.

Large doses cause gastric irritation, diarrhoea, etc.

**Remarks.**

Eliminated by the kidneys, skin, saliva and tears. Symptoms of poisoning. Burning in the oesophagus and stomach, constriction of the throat, acrid, metallic taste, violent vomiting and purging, rapid respiration, etc.

Antidote—The freshly precipitated sesquioxide of iron.



## Class XI.—EMETIC.

### APOMORPHIÆ HYDROCHLORAS.

#### Brain.

##### *Cerebrum—*

First stimulates, then paralyzes.

#### Spinal Cord.

First stimulated, then paralyzed.

#### Sensory Nerves.

First stimulated, then paralyzed.

#### Motor Nerves.

First stimulated, then paralyzed.

#### Circulation.

##### *Heart—*

Small doses no action upon the circulation.

Large doses paralyze by direct action on heart.

##### *Arterial pressure—*

Primarily, raised by stimulation of the vaso-motor centres; secondarily, lowered by action on cardiac muscle. Pulse rate increased by medium doses; diminished by toxic doses.

#### Respiration.

Increased by stimulation of the respiratory centres.

#### Remarks.

Not an irritant, chief indications as an emetic.



## Class XII.—DIAPHORETIC.

### JABORANDI.

#### ACTIVE PRINCIPLES—PILOCARPIA.

##### Circulation.

###### *Heart—*

Full doses paralyze inhibitory nerves.

Final arrest of heart in diastole, preceded by irregular action.

###### *Arterial pressure—*

Reduced.

##### Temperature.

Lowered.

Occasionally elevated 1°-2° F. during early stages of sweating.

##### Eye.

Pupil contracted; nearest and farthest points of distinct vision approximated.

##### Secretion.

Sweat enormously increased in quantity. Elimination of urea from the skin greatly augmented.

Flow of saliva greatly increased. Sometimes salivation almost replaces the sweating.

## Class XIII.—OXYTOCIC.

### ERGOTA.

##### Muscular System.

Functional activity of involuntary muscles increased.

##### Circulation.

###### *Heart—*

Diminished in frequency by stimulation of peripheral ends of inhibitory nerves.

Very large doses increase frequency by direct action on cardiac muscle, and finally paralyze.

###### *Arterial pressure—*

Increased by stimulation of vaso-motor centres.



**Oxytocic—Continued.****Digestive Apparatus.***Intestinal canal—*

Increased peristalsis, due to stimulation of muscular coat or contained ganglia.

**Temperature.**

Lowered by toxic doses.

**Genito-Urinary Apparatus.***Uterus—*

Increased contractions in parturition, both in length and severity, tonic contraction produced if given in sufficient dose; action due to stimulation of nerve centres, or to direct action on uterus or its nerve fibres. Prior to parturition, action varies, but in large majority of cases contractions are produced, this also applies to unimpregnated womb.

**Eye.**

Pupil dilated.

**Mode of Producing Death.**

Slow exhaustion, or rapid paralysis of nerve centres.

**Remarks.**

Gangrene sometimes produced by contraction of the arterioles and obstruction of the circulation.

**Class XIV.—ANTIZYMOtics.****ACIDUM CARBOLICUM.****Local Action.**

In concentrated form, produces anaesthesia, and causes the formation of an eschar.

**Nervous System.**

Causes stupor, and convulsions, which are probably cerebral.



**Antizymotics—Continued.****Circulation.**

Paralyzes the vaso-motor centre in the medulla before it affects the heart.

Probably a cardiac depressant.

**Respiration.**

Accelerated in first stage of poisoning by stimulation of the peripheral vagi, and of the respiratory centres. (Salkowski.)

Later, rhythm disturbed.

**Temperature.**

Lowered. (Hare.)

**Urine.**

In poisoning, the urine, which at first is clear yellow or golden yellow, becomes dark olive, and finally, often blackish-green. The addition of nitric acid, and then potassa, produces a blood-red color.

**Mode of Producing Death.**

Cardiac paralysis.

The main symptoms of poisoning are disturbed respiration, frequent feeble pulse, coma, muscular weakness and sometimes convulsions.

**Remarks.**

Antiseptic.

Antidotes—saccharated lime, soluble sulphates, olive oil.

**ACIDUM SALICYLICUM.****Local Action.**

Irritant to mucous membrane.

**Circulation.***Heart—*

Primarily, increases; secondarily, diminishes force by direct action on the cardiac muscle.

*Arterial pressure—*

Primarily, increased by stimulation of the heart and vaso-motor centres; secondarily, diminished by depression of the same.

(Action on circulation not fully established.)



### **Antizymotics—*Continued.***

#### **Respiration.**

Primarily, quickened by stimulation of pulmonary vagi.  
Large doses arrest by depression of respiratory centres.

#### **Temperature.**

Lowered. (Very slightly.)

#### **Secretion.**

Sweat increased.

#### **Mode of Producing Death.**

Asphyxia.

#### **Remarks.**

Eliminated by the urine, which, when the acid is used freely, becomes green in color.







QV S796s 1888

61820610R



NLM 05063103 9

NATIONAL LIBRARY OF MEDICINE